

Abstract of the Disclosure

A method of adhering copper thin film to a substrate in an integrated circuit structure includes preparing a substrate, including forming active regions and trenches for interconnect structures; depositing a metal barrier layer on the substrate; depositing an ultra thin film layer of tungsten over the barrier metal layer; depositing a copper thin film on the tungsten ultra thin film layer; removing excess copper and tungsten to the level of the metal barrier layer; and completing the integrated circuit structure. An integrated circuit having a copper interconnect therein formed over a layer of barrier metal includes a substrate, including active regions, vias and trenches for interconnect structures; a metal barrier layer formed on the substrate, wherein said metal barrier layer is taken from the group of materials consisting of Ta, TiN, TaN, TaSiN and TiSiN, and formed to a thickness of between about 5 nm to 10 nm; an ultra thin film layer of tungsten formed on the barrier metal layer, said tungsten ultra thin film layer having a thickness of between about 1 nm to 5 nm; and a copper thin film layer formed on the tungsten ultra thin film layer to a thickness sufficient to fill the vias and trenches.

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